GENE-1350

TI OMAP 3503/3530 Processor

RISC CPU Module

USB2.0 Host x 2 / USB2.0 Client x1

RS-232 x 1/ RS-232/485 x 1

TTL UART x 1

256MB NAND Flash, SD, MicroSD

GENE-1350 Rev.A Manual 1st Ed.
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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 GENE-1350 CPU Module
- 1 CD-ROM for manual (in PDF format)

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

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Chapter

1

General Information

1.1 Introduction

GENE-1350 adopts TI OMAP 3503/3530 Processor. This RISC CPU module features low power consumption and cost-efficiency, to fulfill the requirements of hardy and more cost-focusing applications.

The module has 2COM ports (1 RS-232, 1 RS-232/485), 2 USB2.0 host, 1 USB2.0 Client, Digital I/O, etc., to connect and control the peripheral devices. Two Mini Card (with USB interface only) and one Proprietary Expansion Slot make the implementation of external expansion. The CPU frequency is up to 600 MHz and shows a better performance. In addition, the GENE-1350 companies with TI OMAP 3 Display Companion Chipset, the 3D Graphics & Video Accelerator support with 3530 processor.

The power-saving contribution helps GENE-1350 to run rich multimedia applications and perform excellently. For targeting at the vehicle PC and mobile device markets, the GENE-1350 is no doubt the best solution.

1.2 Features

- TI OMAP 3503/3530 Processor
- 3D Graphics & Video Accelerator Support with 3530 Processor
- Onboard 128/256 MB (Optional) LP DDR RAM
- 10/100Base-TX Ethernet
- CRT/ 24-Bit TTL LCD/ 18-Bit LVDS LCD
- 2CH Audio
- Onoboard NAND Flash, SD, MicroSD
- USB2.0 Host x 2, USB2.0 Client x 1, COM x 2, 8-bit Digital I/O
- Mini Card x 2, Proprietary Expansion Slot x 1
- +9V To +24V DC Input
- Onboard 4-Wire Resistive Touch Screen Controller
- Onboard Battery Charger
- Windows® CE 6.0/ Linux Kernal 2.6.32
- Less Than 3 Watts Power Consumption

1.3 Specifications

System

• CPU	TI OMAP 3503/3530 600 MHz Processor
• System Memory	Onboard 128/256MB (Optional) LP DDR RAM
• Ethernet	Davicom DM9000AEP, 10/100Base-TX, RJ-45 x 1
• Boot Loader	Microsoft Windows CE or Linux
• Expansion Interface	Mini Card (with USB interface only) x 2, Proprietary Expansion Slot x 1
• Watchdog Timer	Generates a Time-out System Reset
• Power Requirement	+9V to +24V DC
• Battery	Lithium battery
• Power Consumption	TI OMAP 3530, 128MB LP DDR, 0.24A @ +12V
• Board Size	5.75”(L) x 4”(W) (146mm x 101.6mm)
• Gross Weight	0.88lb (0.4kg)
• Operating Temperature	32˚F~158˚F (0˚C~70˚C)
• Storage Temperature	-40˚F~176˚F (-40˚C~80˚C)
• Operating Humidity	0%~90% relative humidity,

	non-condensing
• MTBF (Hours)	100,000

Display

• Chipset	TI OMAP 3
• Resolution	Up to 1280x768 for LCD Up to 1024x768 for CRT
• LCD Interface	Up to 24-bit single channel TTL and 18-bit single channel LVDS LCD

I/O

• Storage	256MB NAND Flash, SD, MicroSD
• Serial Port	RS-232 x 1, RS-232/422/485 (auto flow) x 1, TTL UART x 1
• Universal Serial Bus	USB2.0 Host x 2, USB2.0 Client x 1
• Digital I/O	Supports 8-bit (Programmable)
• Audio	Line-in, Line-out, Mic-in, Speaker-out (1W amplifier)
• Touch Screen	Supports 4-wire resistive touch screen
• Keypad Interface	Supports 6x6 matrix keypad
• Motion Sensor	ST LIS35DE

Chapter

2

Quick Installation Guide

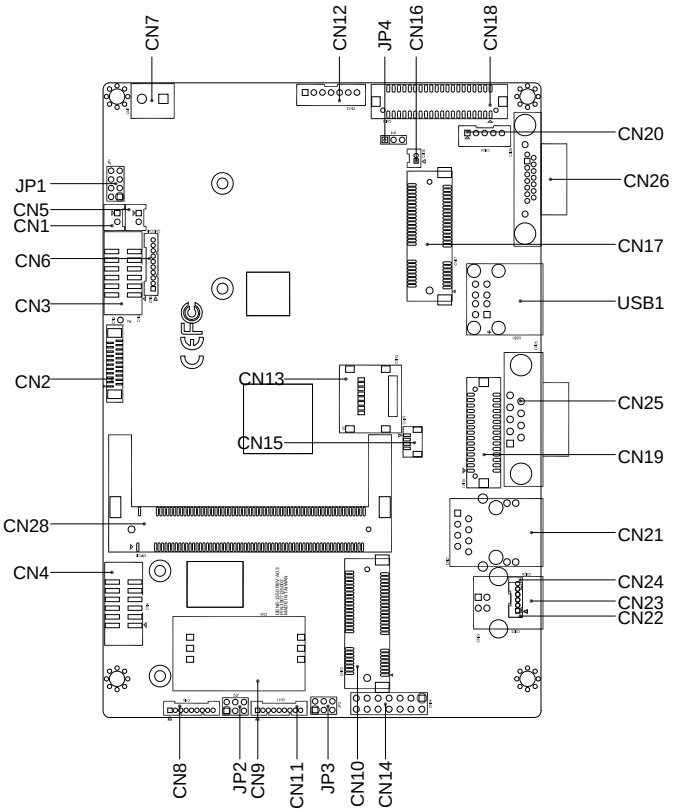
2.1 Safety Precautions

Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

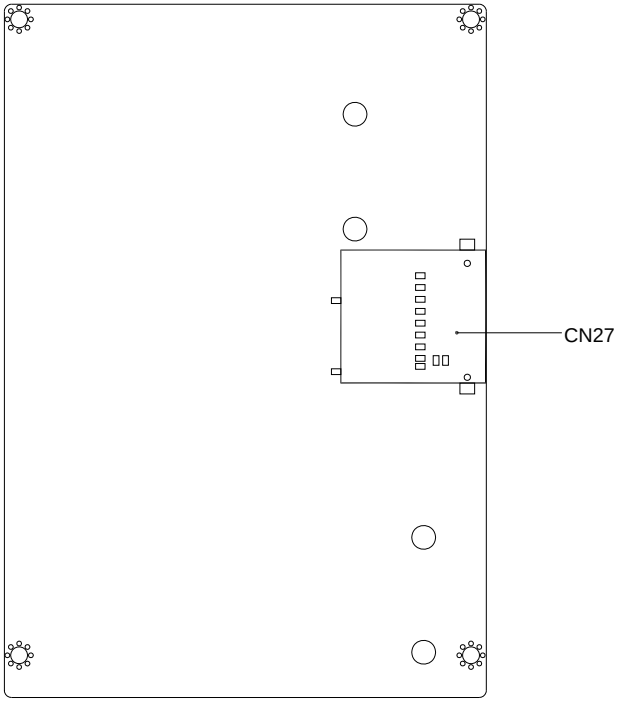
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

Component Side

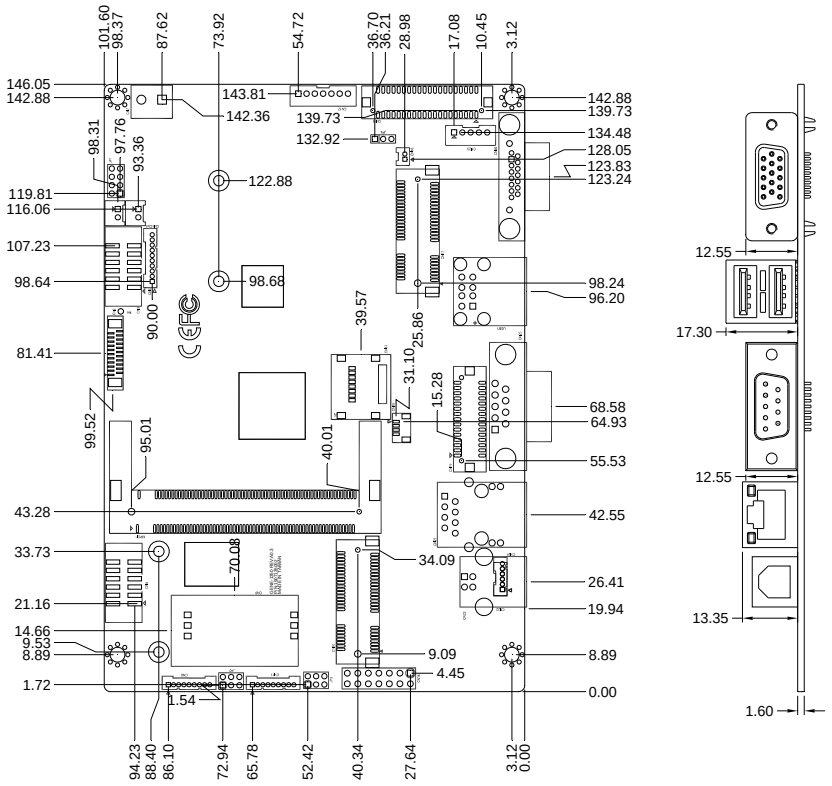


Solder Side

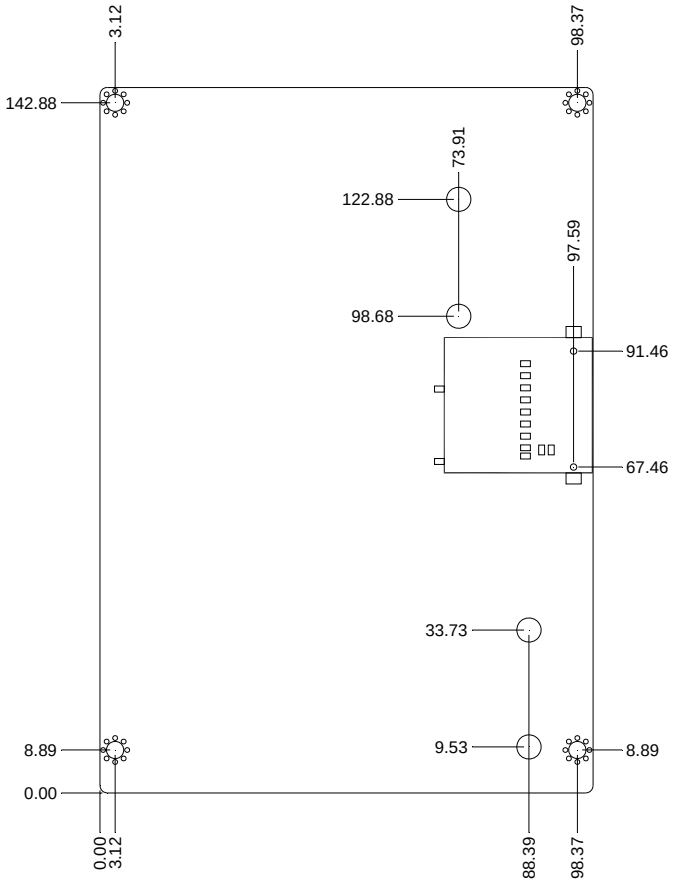


2.3 Mechanical Drawing

Component Side



Solder Side


3.12
98.37
142.88
73.91
122.88
97.59
98.68
91.46
67.46
33.73
8.89
9.53
8.89
0.00
0.00
3.12
88.39
98.37

2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Label	Function
JP1	Reset Selection
JP2	COM2 VCC Selection
JP3	COM2 RS-232/422/485 Selection
JP4	LVDS Backlight Voltage Selection

2.5 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application.

The table below shows the function of each of the board's connectors:

Label	Function
CN1	Right audio amplifier output Connector
CN2	Camera Module Connector
CN3	Keypad Connector
CN4	Digital I/O Connector
CN5	Left Audio Amplifier Output Connector
CN6	MIC/LINE IN/LINE OUT Connector
CN7	External DC IN 9~24V Connector
CN8	UART1 Port Connector
CN9	SIM Card Connector
CN10	Mini Card 1 Connector

CN11	COM2 RS232/422/485 Connector
CN12	Battery Connector
CN13	Micro SD Connector
CN14	JTAG Connector
CN15	Touch Panel Connector
CN16	Backup Battery Connector
CN17	Mini Card 2 Connector
CN18	TTL LCD Connector
CN19	LVDS LCD Connector
CN20	LCD Inverter Connector
CN21	Ethernet RJ-45 Connector
CN23	USB Client Connector
CN25	COM1 RS-232 Connector
CN26	D-SUB VGA Connector
CN27	SD Card Connector
CN28	Proprietary Expansion 124-Pin Slot

Note: CN2 is parallel interface, which supports two modes:

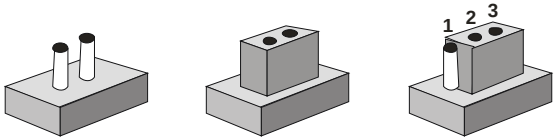
SYNC mode: In this mode, the image-sensor module provides horizontal and vertical synchronization signals to the parallel interface, along with the pixel clock. This mode works with 8-, 10-, 11-, and 12-bit data (above 10-bit RAW data, the processing pipe cannot be used; data must be transferred to memory). SYNC mode supports progressive and interlaced image-sensor modules.

ITU mode: In this mode, the image-sensor module provides an ITU-R BT 656-compatible data stream. The horizontal and vertical synchronization signals are not provided to the interface. Instead, the data stream embeds start-of-active (SAV) and end-of-active video (EAV) synchronization code. This mode works in 8- and 10-bit configurations. It supports only progressive image-sensor modules.

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



Open **Closed** **Closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.7 Reset Selection (JP1)

JP1	Function
1-2	PWRON
3-4	HWRST#
5-6	WARMRST#

2.8 COM2 VCC Selection (JP2)

JP2	Function
1-2	3.3V (Default)
3-4	5V

2.9 COM2 RS-232/422/485 Selection (JP3)

JP3	Function
1-2 3-4	RS-485
	RS-232 (Default)
3-4 5-6	RS-422

2.10 LVDS Backlight Voltage Selection (JP4)

JP4	Function
1-2	5V (Default)
2-3	VIN

2.11 Right Audio Amplifier Output Connector (CN1)

Pin	Signal
1	SPK_RO-
2	SPK_RO+

2.12 Camera Module Connector (CN2)

Pin	Signal	Pin	Signal
1	VCC3.3	2	VCC3.3
3	VIO_1v8	4	GND
5	GND	6	CAM_HS
7	CAM_VS	8	CAM_PCLK
9	CAM_XCLKA	10	I2C_SDA
11	I2C_SCL	12	CAM_D0
13	CAM_D1	14	CAM_D2
15	CAM_D3	16	CAM_D4
17	CAM_D5	18	CAM_D6
19	CAM_D7	20	SYS_nRESWARM

Note: The max. rating of Pin 1,2 is 0.5A@3.3V
The max. rating of Pin 3 is 0.5A@1.8V

2.13 Keypad Connector (CN3)

Pin	Signal	Pin	Signal
1	KPD.C5	2	KPD.R5
3	KPD.C4	4	KPD.R4
5	KPD.C3	6	KPD.R3
7	KPD.C2	8	KPD.R2
9	KPD.C1	10	KPD.R1
11	KPD.C0	12	KPD.R0

2.14 Digital I/O Connector (CN4)

Pin	Signal	Pin	Signal
1	VCC	2	VCC
3	GPIO_1	4	GPIO_2

5	GPIO_3	6	GPIO_4
7	GPIO_5	8	GPIO_6
9	GPIO_7	10	GPIO_8
11	Ground	12	Ground

Note: The max. rating of Pin 1, 2 is 0.5A @ 3.3V; the max. rating of Pin 3 ~ Pin 10 is 8mA @ 3.3V

2.15 Left Audio Amplifier Output Connector (CN5)

Pin	Signal
1	SPK_LO+
2	SPK_LO-

2.16 MIC/Line In / Line Out Connector (CN6)

Pin	Signal	Pin	Signal
1	MIC1_IN	2	Null
3	GNDMIC	4	AUXRIN
5	Null	6	GNDAUD
7	LOUT_L	8	GNDAUD
9	LOUT_R	10	Null

2.17 External DC IN 9~24V Connector (CN7)

Pin	Signal
1	VIN_SW
2	Ground

2.18 UART1 Port Connector (CN8)

Pin	Signal	Pin	Signal
1	VCC3.3	2	BT_RST_TTL
3	UART1_RTS_TTL	4	UART1_TX_TTL
5	UART1_CTS_TTL	6	UART1_RX_TTL
7	Null	8	Null

9	Ground

Note: The max. rating of Pin 1 is 0.5A @ 3.3V

2.19 SIM Card Connector (CN9)

Pin	Signal	Pin	Signal
1	UIM_PWR	2	UIM_RST
3	UIM_CLK	4	Ground
5	UIM_VPP	6	UIM_DATA

2.20 Mini Card 1 Connector (CN10)

Pin	Signal	Pin	Signal
1	Null	2	VCC3.3_DUAL1
3	Null	4	Ground
5	Null	6	VCCA1V5
7	Null	8	UIM_PWR
9	Ground	10	UIM_DATA
11	Null	12	UIM_CLK
13	Null	14	UIM_RESET
15	Ground	16	UIM_VPP
17	Null	18	Ground
19	Null	20	W_DISABLE#
21	Ground	22	IO_USB_nRESET
23	Null	24	VCC3.3_DUAL1
25	Null	26	Ground
27	Ground	28	VCCA1V5
29	Ground	30	Null
31	Null	32	Null
33	Null	34	Ground

35	Ground	36	DM3
37	Ground	38	DP3
39	VCC3.3_BAT	40	Ground
41	VCC3.3_BAT	42	Null
43	Ground	44	Null
45	Null	46	Null
47	Null	48	VCCA1V5
49	Null	50	Ground
51	Null	52	VCC3.3_DUAL1

2.21 COM2 RS-232/422/485 Connector (CN11)

Pin	Signal	Pin	Signal
1	DCD2	2	Null
3	RXD2	4	RTS2
5	TXD2	6	CTS2
7	DTR2	8	COM_VCC
9	Ground		

2.22 Battery Connector (CN12)

Pin	Signal	Pin	Signal
1	VCC_PACK	2	VCC_PACK
3	SMBUS_SCL_3v3	4	SMBUS_SDA_3v3
5	CH_TS	6	Ground
7	Ground		

2.23 Micro SD Connector (CN13)

Pin	Signal	Pin	Signal
1	DAT2	2	DAT3
3	CMD	4	VDD_MMC2
5	CLK	6	Ground

7	DAT0	8	DAT1
9	Ground	10	Ground
11	Ground	12	Ground

2.24 JTAG Connector (CN14)

Pin	Signal	Pin	Signal
1	R_JTAG_HDR_TMS	2	R_JTAG_HDR_TRST
3	R_JTAG_HDR_TDI	4	Ground
5	VCC_JTAG	6	Null
7	JTAG_HDR_TDO	8	Ground
9	JTAG_HDR_RTCK	10	Ground
11	R_JTAG_HDR_TCK	12	Ground
13	R_JTAG_HDR_nEMU0	14	Ground

2.25 Touch Panel Connector (CN15)

Pin	Signal
1	XP
2	XN
3	YP
4	YN

2.26 Backup Battery Connector (CN16)

Pin	Signal
1	VCC_RTC
2	Ground

2.27 Mini Card 2 Connector (CN17)

Pin	Signal	Pin	Signal
1	Null	2	VCC3.3_DUAL2

3	Null	4	Ground
5	Null	6	VCCB1V5
7	Null	8	UIM_PWR
9	Ground	10	UIM_DATA
11	Null	12	UIM_CLK
13	Null	14	UIM_RESET
15	Ground	16	UIM_VPP
17	Null	18	Ground
19	Null	20	W_DISABLE#
21	Null	22	IO_USB_nRESET
23	Null	24	VCC3.3_DUAL2
25	Null	26	Ground
27	Ground	28	VCCB1V5
29	Ground	30	Null
31	Null	32	Null
33	Null	34	Ground
35	Ground	36	DM4
37	Ground	38	DP4
39	VCC3.3_BAT	40	Ground
41	VCC3.3_BAT	42	Null
43	Ground	44	Null
45	Null	46	Null
47	Null	48	VCCB1V5
49	Null	50	Ground
51	Null	52	VCC3.3_DUAL2

2.28 TTL LCD Connector (CN18)

Pin	Signal	Pin	Signal
1	VCC_PP1	2	VCC_PP1

3	Ground	4	Ground
5	VCC_PP1	6	VCC_PP1
7	LCD1_ENBKL	8	Ground
9	LCD1_CN_B0	10	LCD1_CN_B1
11	LCD1_CN_B2	12	LCD1_CN_B3
13	LCD1_CN_B4	14	LCD1_CN_B5
15	LCD1_CN_B6	16	LCD1_CN_B7
17	LCD1_CN_G0	18	LCD1_CN_G1
19	LCD1_CN_G2	20	LCD1_CN_G3
21	LCD1_CN_G4	22	LCD1_CN_G5
23	LCD1_CN_G6	24	LCD1_CN_G7
25	LCD1_CN_R0	26	LCD1_CN_R1
27	LCD1_CN_R2	28	LCD1_CN_R3
29	LCD1_CN_R4	30	LCD1_CN_R5
31	LCD1_CN_R6	32	LCD1_CN_R7
33	Ground	34	Ground
35	LCD1_DOTCLK	36	LCD1_VSCLKR
37	LCD1_DENR	38	LCD1_HSCLKR
39	Null	40	Null

Note: The max. rating of Pin 1,2,5,6 is 0.5A @ 3.3V

2.29 LVDS LCD Connector (CN19)

Pin	Signal	Pin	Signal
1	ENABLK	2	BK_CTL
3	VCC_LVDS	4	Ground
5	CLK1M	6	CLK1P
7	VCC_LVDS	8	Ground
9	A0M	10	A0P

11	A1M	12	A1P
13	A2M	14	A2P
15	Null	16	Null
17	LVDSSPD	18	LVDSSPC
19	Null	20	Null
21	Null	22	Null
23	Null	24	Null
25	Null	26	Null
27	VCC_LVDS	28	Ground
29	Null	30	Null

Note: The max. rating of Pin 3,7,27 is 0.5A @ 3.3V

2.30 LCD Inverter Connector (CN20)

Pin	Signal
1	VCC_IVT (Inverter power)
2	Ground
3	LCD1_ENBKL
4	BK_CTL
5	Ground

2.31 Ethernet RJ-45 Connector (CN21)

Pin	Signal	Pin	Signal
1	LAN_RD-	2	LAN_RD+
3	AVDD_LAN	4	Null
5	Null	6	AVDD_LAN
7	LAN_TD-	8	LAN_TD+
9	VCC3.3	10	LINK_LED
11	VCC3.3	12	SPEED_LED
13	LANGND	14	LANGND

15	Null	16	Null

Note: The max. rating of Pin 1 is 0.7A @ 5V

2.32 USB Client Connector (CN23)

Pin	Signal
1	VCC_USBOTG
2	OTG_DN
3	OTG_DP
4	Ground

2.33 COM1 RS-232 Connector (CN25)

Pin	Signal
1	NDCD1
2	NRXD1
3	NTXD1
4	NDTR1
5	CGND
6	NDSR1
7	NRTS1
8	NCTS1
9	NRI1

2.34 D-SUB VGA Connector (CN26)

Pin	Signal	Pin	Signal
1	RED	2	GREEN
3	BLUE	4	Null
5	AGND	6	AGND
7	AGND	8	AGND
9	VGAVCC	10	AGND

11	Null	12	CRT_CN_SCL
13	CRT_CN_HSYNC	14	CRT_CN_VSYNC
15	CRT_CN_SDA		

2.35 SD Card Connector (CN27)

Pin	Signal	Pin	Signal
1	MMC1_DAT3	2	MMC1_CMD
3	Ground	4	VDD_MMC1
5	MMC1_CLK	6	Ground
7	MMC1_DAT0	8	MMC1_DAT1
9	MMC1_DAT2	10	MMC1_CD
11	Ground	12	MMC1_WP
13	Ground	14	Ground
15	Ground		

2.36 Proprietary Expansion 124-Pin Slot (CN28)

Pin	Signal	Pin	Signal
1	Null	2	Null
3	GPIO_BUF1	4	GPIO_BUF2
5	GPIO_BUF3	6	GPIO_BUF4
7	GPIO_BUF5	8	GPIO_BUF6
9	GPIO_BUF7	10	GPIO_BUF8
11	VIO_1V8	12	VIO_1V8
13	VIO_1V8	14	VIO_1V8
15	Null	16	VIO_1V8
17	Null	18	Null
19	Null	20	Gpt11_pwm
21	GPMC_nCS4	22	Null
23	Ground	24	Null

25	GPMC_nCS7/IO_DIR	26	GPMC_nCS5
27	Ground	28	Null
29	GPMC_A21	30	GPMC_nWE
31	Null	32	Ground
33	GPMC_A17	34	GPMC_A20
35	GPMC_A18	36	GPMC_nBE0_CLE
37	Ground	38	Null
39	GPMC_nOE	40	Null
41	GPMC_WAIT0	42	Null
43	GPMC_WAIT3	44	GPMC_nCS0
45	GPMC_nWP	46	GPMC_nCS3
47	GPMC_nADV_ALE	48	GPMC_nBE1
49	Ground	50	Ground
51	GPMC_A26	52	Null
53	GPMC_A25	54	SPI4_CLK
55	Ground	56	SPI4_SIMO
57	GPMC_A23	58	SPI4_SOMI
59	GPMC_A19	60	SPI4_nCS0
61	GPMC_A22	62	Ground
63	VCC3.3_BAT	64	SYS_nRESPWRON
65	GPMC_A24	66	GPMC_D0
67	GPMC_D1	68	GPMC_D2
69	Ground	70	VCC3.3_BAT
71	GPMC_D3	72	GPMC_D4
73	GPMC_D5	74	Ground
75	GPMC_D7	76	GPMC_D6
77	Ground	78	GPMC_D8
79	GPMC_D9	80	GPMC_D10

81	GPMC_D11	82	Ground
83	Ground	84	GPMC_D12
85	GPMC_D13	86	GPMC_D14
87	GPMC_D15	88	VCC3.3_BAT
89	VCC3.3_BAT	90	GPMC_CLK
91	Null	92	I2C_SDA
93	Null	94	I2C_SCL
95	Null	96	Null
97	VCC5	98	Null
99	Null	100	Null
101	Ground	102	Ground
103	Null	104	Null
105	Null	106	Null
107	Null	108	SYS_CLKOUT2
109	Null	110	Null
111	Null	112	Vmain
113	Ground	114	Ground
115	Null	116	Null
117	Ground	118	Ground
119	Ground	120	Ground
121	VCC5	122	Null
123	VCC5	124	VCC3.3_BAT

Note: The max. rating of Pin 11,12,13,14,16,63,70,88,89,97,121,123,124 is 0.7A @ 5V

Below Table for China RoHS Requirements
产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板及其电子组件	×	○	○	○	○	○
外部信号连接器及线材	×	○	○	○	○	○

O：表示该有毒有害物质在该部件所有均质材料中的含量均在 **SJ/T 11363-2006** 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 **SJ/T 11363-2006** 标准规定的限量要求。

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。